Lower Columbia College

**General Changes?**

Team members have prepared workshops for students in precollege math on a wide variety of topics related to math content, success attributes, and study skills.

Instructor and student materials have been placed in an electronic repository so the workshops

can be repeated each quarter. Each workshop is scheduled for multiple times each quarter and

“just-in-time.” Additional workshops are being developed and will have supporting material

archived in the repository. The schedule is posted prominently and is a featured part of each

PCM (precollege math) class.

Faculty have created practice tests for each module, worksheets organized by topic, vetted

websites, classroom activities, and other many other instructional materials for each of our

new courses (Math 078, 079, 088, 089, 098, and 099). A common final is now used by all

instructors. Each of the new courses also has support materials. For example, instructors can

use any of the following: Module 1 Practice (available for modules 1-14); Multiply and divide

Rational Expressions; Operations on Radicals; Rational Equations; Rules of Exponents;

Systems of Equations; etc. These and others are all available online for our instructors at

<http://lowercolumbia.mylabsplus.com> . They are also archived on a network folder.

We have created a schedule with seven entry points and two planned exit points, depending

on their academic skills and plans. In the old schedule we had four entry points.

We have established instructor expectations for each of the courses.

We have developed a new diagnostic placement instrument, and in collaboration with the

college’s IT department and placement center, have implemented its use. College advisors

have received training on the placement system. Students can access the online test space and practice.

The Math Achievement Center may represent the most significant improvement over the prior

system. It is a popular alternative to classroom instruction, and we have large waiting lists

each quarter. The major difficulty in raising student success in the MAC has been irregular

student participation. To counter this, we implemented a weekly participation requirement for

students enrolled in the Math Achievement Center. The immediate effect has been to increase

visible student participation in the course, and they no longer arrive late in quarter saying they

are now ready to begin their “self-paced” class. Whether this translates into increased student

success, we cannot make a conclusion as yet. We have also clarified in the schedule that this

is not an online course, so students should understand the expectation of on-campus, weekly

engagement.

**Common practices?**

CATs – Terri Skeie has prepared a letter to invite PCM faculty to use CATs and to follow up

with her in a brief assessment. We have supported workshops to provide training on CATs to

faculty. The most frequently used CAT has been the clearest and muddiest point, with

several faculty reporting that their daily practice is now informed by this assessment. Some

are also using the feedback immediately. Faculty actively using CATs are: Terri Skeie, Mike

Skeie, Bryn Byker and Rick Brien, Sue Johnson and Alice Trevino.

All newly hired faculty are part of our professional partner program, and receive feedback

from a more experienced faculty partner. They are also invited to attend other faculty’s class

sessions. Classroom observations are performed annually or more frequently by the transfer

dean, with formative feedback provided directly to the faculty.

FIGs are increasingly more effective at bringing faculty together to talk about instructional

practice and student work. The curriculum in the 07X sequence has been sufficiently mature

so that faculty can focus more on delivery and andragogy. We anticipate this will happen

during the next year with the 08X and 09X courses in the next year.

Classroom exchanges have not become a common practice and will be an area of special

focus in this next year.

**Evidence on faculty perspectives and practice?**

Of the current 7 full-time math faculty:

\* 7 have participated in curriculum revision and have attended at least one “FIG” meeting.

\* 6 have attended meetings regarding the use of CATs.

\* 5 have attended an RPM sponsored event (summer institute and/or quarterly retreat)

Of the 13 adjunct faculty employed at LCC in the pre-college math area during the last year:

\* 9 have attended a FIG

\* 6 have attended training on CATs

\* 4 have attended (or will attend) an RPM sponsored event (summer institute and/or quarterly

retreat)

\* 11 have attended at least one technology training on MyMathLab

Considering the challenges of overcoming inertia and suspicion, these numbers are quite

encouraging.

Additional data to collect include more direct probing of changed perception and practice

resulting from the grant. This year we will ask directly questions regarding the use and

implementation of CATs, how FIGs are informing faculty practice, and what faculty feel they

need to more fully engage in classroom exchanges.These data are influencing the planning for next year as we have budgeted more resources for FIGs and exchanges.

Highline

**General Changes?**

Since our project involves the implementation of a new precollege curriculum that replaces all

sections of our previous curriculum, most of our time was spent on activities related to this

transition: advising students and colleagues, adjusting schedules, changing materials, providing training and support to instructors, and measuring the new curriculum’s impact. In fall, we offered the final sections of the old curriculum’s Math 97 course, and introduced the new Math 98 intermediate algebra course for students planning to take Calculus. As of winter quarter, all students – including those in Highline’s “Weekend College” – were enrolled in the new curriculum.

Building on the work of our Weekend College instructor, Colette Bailey, Diana and Aaron

developed and taught hybrid and online versions of our new courses. The developmental

math committee (Barbara, Diana, Erik, and Aaron) met throughout the year to identify and

address issues such as clarifying learning outcomes and content expectations for faculty.

Helen continued to lead the evaluation effort, obtaining data on student persistence and

achievement throughout the quarter from each instructor. She also administered attitudinal

surveys to students in all sections of Math 81 and 91 each quarter. Helen also kept abreast of

JAOG discussions related to pre-college mathematics. During summer of 2011, she

coordinated a focus group for dev math students, facilitated by Darryl Brice (sociology) and

Yoshiko Harden (student services).

Our remaining activities were typically grant-specific. We contributed to the RPM Wiki, and

participated in conference calls and Elluminate sessions related to CATs and FIGs. Erik and

Diana also had several conversations with Mickey Davis about changing faculty culture

around examining student learning.

As we approach the end of year 2, we are making adjustments based on what we’ve learned from the first year of implementation. There is a general consensus among faculty that Math 91 contains too much content, so we are shifting the statistics topics into Math 81. This puts all the formal statistics training into Math 81, and allows Math 91 to more clearly focus on the concept of function. The mastery test on functions in Math 91 is being revised to more effectively target the specific abilities students should master. This is the result of discussion of trends in student performance on specific questions which took place in and outside of the FIGs. We are also revising our online materials archive and developing a new strategy for the FIGs.

Our stated goals for the curriculum were:

(1) Reduce the number of pre-college courses needed by most students from three courses to

two courses

(2) Ensure the mathematical content is truly relevant to student's career, academic and life

goals

(3) Actively help students develop college-readiness skills, including successful learning

habits and attitudes.

We have accomplished task 1, and made significant progress on tasks 2 and 3. All instructors

have incorporated aspects of 2 and 3 into their teaching, but we need more feedback from

students to determine how well they feel we’ve accomplished the second goal. And it is a bit

too soon to determine the long-term impact of our efforts toward goal #3.

**Common practices?**

The three common practices were woven together as part of our faculty inquiry groups (FIGs). Each quarter, we organized two FIGs – one for instructors teaching Math 81 and one for those teaching Math 91. They were overseen by the lead instructors for those two courses, Diana Lee and Erik Scott. Participants in the FIGs were expected to attend 3 – 4 face-to-face meetings for collaborative discussion of pedagogy and student learning, use Classroom Assessment Techniques (CATs), and participate in reciprocal observations (classroom exchanges).

In fall everyone completed the tasks described above, but we identified several areas for improvement. We found it difficult to keep the discussions within the face-to-face meetings focused on the students’ learning process. This was largely because instructors learning our curriculum were focused on aspects of implementation, such as how to use the online homework system or how to score and report data about the mastery tests. The learning curve also meant that the reciprocal observations and CATs did not significantly deepen our discourse about student learning. Although nearly all instructors made a serious effort to complete the tasks, many felt overwhelmed by the number of things they were trying to implement, and therefore could not engage in them deeply.

Drawing upon our experiences in fall as well as conversations with Mickey Davis and Bill Moore, we modified the FIGs for winter. We continued the meetings but emphasized that the focus would be collaborative examination of student learning, with “faculty support” discussions taking place individually. The use of CATs and reciprocal observations were still encouraged, especially for faculty who had taught the course in fall. However, greater emphasis was placed on using CATs and observations as tools for examining student learning– to provide samples of student work that could be examined, and to generate questions for inquiry. These changes and larger number of faculty who had taught the new curriculum coincided with a greater focus on student learning. More faculty shared examples of student work, and we identified error patterns on the functions mastery test in Math 91 which prompted a revision of that test. To accommodate instructor schedules, we ran two Math 91 FIGS in that quarter.

The FIGs in winter quarter showed progress toward our goal of sustained inquiry into student learning, but also revealed the difficulty of getting faculty to “own” this process themselves. The lead instructors felt that participants looked to them to drive the FIG meetings, meaning that participants would often wait for a prompt rather than pose questions or describe their own inquiry activities. This occurred even when participants were given guidance about how to prepare for the meetings. Differences in instructors’ level of inquiry or reflection also made it difficult to engage in collaborative inquiry of a single topic.

The spring quarter FIGs operated more like those in winter quarter, deemphasizing CATs and observations while trying to help faculty engage in greater ongoing reflection on the teaching and learning in their individual classrooms. Drawing on our experiences in spring and previous quarters, we plan to make the following adjustments in the coming year. First, we need to focus on helping individuals develop a habit of investigating aspects of their students’ learning, akin to the assessment cycle of identifying goals, taking action, measuring achievement, and using the results to determine the next action. Second, we need to find tasks that provide greater insight into how students process the material – most of the written products we collect show symbolic manipulation, but reveal very little about the reasoning behind it. The “invisibility” of the students’ reasoning greatly limits the depth of our inquiry. Third, we plan to organize our FIG groups around inquiry topics rather than class level.

**Evidence on faculty perspectives and practice?**

Instructors of Math 81 and 91 have consistently reported their data on student achievement

and attended the FIG meetings. They have actively requested, modified, used materials from

colleagues to address the curricular goals of making the math content relevant to students and

helping students develop college-readiness skills. Participation in FIG activities has been

mixed, and collectively seems proportional to the level of insistence/nagging on the part of

the lead instructor. All instructors used CATs and participated in reciprocal observations in

fall quarter, with fewer doing so in subsequent quarters.

Faculty are reporting that they feel the new curriculum aligns better with the needs of our

student population, and provides faculty with more opportunities to help students see math as

truly relevant to them. More faculty are recognizing their role in helping students develop the

attributes necessary to be successful in college. We have also seen an increase in

conversations about strategies for formative assessment, which grew out of the initial work

with CATs. All instructors have complied with our data requests, and we believe most read

the quarterly reports on student achievement and satisfaction. That said, many instructors do

not view success rates of 50 to 60 percent as problematic; and there is no means of requiring

instructors to take steps to improve student learning. For example, efforts to coordinate

common final questions have been generally unsuccessful. Such efforts would provide

empirical evidence that instructors are capable of achieving higher levels of learning with

more students. These findings—specifically, that we have no formal structures to require

compliance of any sort—have inspired the department to update and change department

policy around expectations for part-time instructors to submit syllabi, to be available by

email, and to participate in department-wide assessment efforts (particularly common final

questions).

Spokane Falls

**General Changes?**

One of stated goals was to get the entire faculty at SFCC through the new developmental sequence and provide training for all instructors (full time and adjunct). This goal has been

90% accomplished (there are a few faculty who have not taught the final sequence of the courses, but an attempt will be made to have them complete this in the fall).

Since we are using a custom published book, this has required us to develop our own set of instructor resources. We have developed a test bank with richer problems then just procedures

and have developed an instructor’s guide. Although these projects are mostly completed, the

finishing touches for these two tasks will be completed next academic year. We have also

conducted training sessions for faculty new to the sequence and videotaped this for future

reference. Some instructors have participated in Ruth Parker’s summer workshop and plan to

use her techniques in modifying our courses to increase student participation and

understanding. We have increased our cooperation and communication with IEL faculty as

they have participated in the scheduled retreats and implemented some of the common

practices. To continue our focus on training we have, at the request of our faculty, planned a

series of forums for the next academic year to focus on specific training needed for the new

course sequence (Use graphing calculators, group work, etc..). One of our stated goals was the

redesign of our transition course from pre-college mathematics to pre-calculus (Math 108)

and we spent a good part of the year planning for possible revisions to that course. We have

conducted some training sessions for our tutors in the Math Learning Center on the new

sequence and we have implemented a tutoring program for our peer tutors concerning the

changes to our curriculum and instructional practices. We have also implemented a pilot

study with our developmental students this summer. In this study a selected group of students

enrolled in the second and third course in our new sequence participated in interviews and

focus groups to discuss and evaluate the new curriculum. This pilot study was completed to

design a more extensive study to be done next year. This study will consist of an extensive pre

and post survey given to our developmental classes and additional interviews/focus groups

that will give us insight into further changes we can make in our instructional practices. This

study will meet our stated goal of program evaluation and hopefully also be the basis for some

faculty inquiry centered on improving instructional practices. The department has also further revised it placement instrument in the past year as to simplify the process of placement and allow for this placement to be a better predictor of student success. In addition, numerous faculty have done presentations on our course redesign and specific aspects of our work at regional and national conferences (Terry Souhrada, Greg Cripe, Deb Olson and Pete Wildman). Further presentations are planned during the coming academic year.

**Common practices?**

At the beginning of the fall quarter 2010 we had a departmental retreat where we introduced

the three common practices. We modeled the process of classroom exchange and presented a

video of a class from one of the team members and asked the department to “practice” a

participation in the exchange using the tools we introduced.

Terry Souhrada is the lead on faculty exchanges and 10 of the 20 faculty (both full and part time) have participated in a classroom exchange. The focus of these exchanges has often been on student interaction in class sometimes on evaluating the effectiveness of group work.

At the retreat in the fall we introduced the idea of classroom assessment. Many instructors were already familiar with the idea of classroom assessment techniques as it is a critical part of an outcomes faculty development course which many have completed. Shawna Cosner is our lead on classroom assessment and 17 of the 20 faculty (both full and part time) have participated by completing at least one CAT.

The idea of faculty inquiry was introduced briefly in the fall at our fall retreat and was the main focus of our winter retreat. There have been three FIGs that have met consistently all year that focused on the content on our three new courses (I will call these course FIGs). Deb Olson is the lead for FIGs and overall 19 of 20 the 20 (both full and part time) have participated in this practice. As the year has progressed, FIGS have moved away from a content focus to a focus on instructional practice. One method used to refocus our FIGS is by looking at student work on tasks which we have designed together. The motivation for these tasks is either big ideas in the course or areas of perceived misunderstanding or difficulties. The tasks have varied from simple procedural to complicated open ended problems. These have informed our practice greatly by exposing both our preconceptions concerning student understanding and allowing us to refocus some of our lessons to focus on particular misunderstandings. We hope to model this process at the RPM Institute workshop in late August as part of the session on Wednesday morning. In addition to the three FIGS that have met the entire year, some other groups have met in a more informally (FIG-lets) to discuss such topics as “what is the most effective way to review”, or “should we have a strong a focus on rational expression or simplifying radicals in our course”.

About half way through the academic year we realized that although many instructors were using these common practices, they were too disconnected. We realized that FIGS might best focus on large questions (solving problems using multiple representations for example) and the common practices could be used to help us answer these questions. This was the main motivation for our refocus of the FIGS towards common student tasks. Our next step is to use the information we have gleaned from these common tasks to focus on our instruction in the classroom. We plan that this will be the main focus of our course FIGS this next year. Since we are in the third year of our systematic curriculum change we decided it would be valuable to get an in depth analysis of student perspectives on the changes we have made and what influence these changes have had on

their behavior, understanding and perceptions. We initiated a thorough study of student perspectives (led by Mickey Davis) that would focus on student attributes, feelings about mathematics and core areas of understanding. We ran a pilot study this summer and it this has

already identified some interesting questions that affect student understanding (for example how we respond to student inquiries). These questions themselves can result in a FIG which would use tools like assessment and classroom observation/exchange to help understand and improve our practice in the coming year.

**Evidence on faculty perspectives and practice?**

We have only gathered evidence informally on faculty perspectives to our new sequence

through reactions of faculty as part of the course FIGs this past year. Since all full time

faculty (except one) and all part time faculty have taught at least one course in the new

sequence, we have a pretty good idea on their general impressions and level of support. We

have noticed that those instructors who have taught through the entire sequence are generally

supportive of the changes. We have discussed potential plans to have some faculty

interviews/focus groups to determine the perspectives of instructors on the changes. As far as

faculty behaviors in the classroom, our data gathering has again been informal through the

discussions in course FIG’s. Instructors have discussed teaching methods and possible

techniques for specific topics. Sometimes these discussions have resulted in a classroom

exchange. These discussions however have not been quantified and we hope to find effective

ways to encourage and find evidence of effective change in faculty behavior in the coming

year. One area of interest as it pertains to faculty perspective is the perspective of some of our

service departments (science in particular) on the changes we have made in the developmental

curriculum. Our dean has gathered anecdotal evidence from science faculty this year in how

pleased they are with what students who have come through the sequence can do. We would

like to find a way to capture these responses.

Everett

**General Changes?**

During the past year, our department implemented major elements of our project plan and collected data to assess the success and achievement of our students:

For the second consecutive year, a conference for high-school math and science instructors was organized by our department. Andrea Cahan took the lead in organizing the event and contacting attendees from local high schools.

During spring quarter, Kevin Bolan introduced the alternative placement model that he developed with the help of local high school math instructors. The alternative placement model allows student to use their high school transcripts to place into EvCC math courses (at the advisement of a math instructor).

The Math 91/92 sequence Elementary/ Intermediate Algebra was introduced during winter quarter. This two course sequence replaces a Elementary/Intermediate Algebra review course, Math 90. This sequence addresses concerns voiced by part-time and full-time faculty regarding our algebra courses.

Math 98: Intermediate Algebra in Context was introduced spring quarter. This course is designed for non-STEM majors. Math 98 was designed to be much different than our current developmental mathematics courses in curriculum, pedagogy, assessment, and the use of technology. In short, Math 98 is a project-based learning course which introduces concepts in

Intermediate Algebra using real-life situations and data.

During February, the department met for RPM Directions, a retreat designed to organize the department on our project work and solicit thoughts for the future of our developmental math courses. 14 math faculty were able to attend this 4-hour retreat (in part or in whole).

During spring quarter, the MOLE Taskforce began meeting to discuss changes to the Math Learning Center. For the MOLE Taskforce, Michael Nevins met with faculty from Bellingham Technical College, Skagit Valley College, and Centralia Community College to discuss their use of technology, math labs, and modular curricula. Most notably, the taskforce designed a modular option for students placing into the lowest levels of our developmental math curriculum. This option will be available to our students fall 2011. By the end of year 2, the MOLE Taskforce will have continued its work with changes to the Math Learning Center (MLC) including a modular option through developmental mathematics and the assessment of the professional/technical math courses offered in the MLC. Also, we will have gathered and assessed data regarding the curriculum changes we made during phase II of the grant. Several FIGs will have been organized and facilitated by members of the department in regards to CATs, Xchanges, Math 98, and the Math 91/92 sequence.

Finally, in order to continue the development of a useful student attributes curriculum for developmental math students, Peg Balachowski and Andrea Cahan have designed a plan to integrate a curriculum in to their pre-algrebra course during fall quarter 2011. Towards the same effort, Brett Kuwada (a counselor) and Michael Nevins will collaborate on a learning community with elementary algebra and a human development course during winter 2012.

**Common practices?**

As described above, we have focused the majority of our project-related efforts towards

evaluating and changing our developmental curriculum and placement system. With that

said, Peg Balachowski led several discussions about the use of CATs during department

meetings. As a result of these discussions, many faculty members used CATs in their

classroom during spring quarter and discussed their experience. Tophe Anderson organized a

FIG about classroom exchanges. The FIG was comprised of six faculty from around campus.

The math, developmental education, adult basic education, and chemistry departments were

all represented in this FIG (3 math faculty). With most of our intended curriculum changes

behind us, the core team plans to spend the bulk of next year collecting data on our

curriculum changes and working to develop a culture of visible teaching and learning in our

department’s classrooms.

**Evidence on faculty perspectives and practice?**

We have not formally compiled data of this sort. Our data gathering has focused on student learning, success, and retention. We would welcome help organizing data of this sort.

Clark

**General Changes?**

Project related activities and events since last summer:

•September 2010 – hosted an informational table at the Fall Orientation fair for faculty and

staff

•Presentations at Math department meetings about the grant inviting faculty to participate in

grant activities

•Informational sessions with pizza for ABE, DVED, and Math faculty during finals week

•Host visits by state level RPM team members Bill Moore and Mickey Davis

•Complex task implementation in class by project team members

•Student survey developed and piloted in core team members classes with assistance of the

Office of Planning and Effectiveness

•Core team members attended various statewide meetings, training events, and national

conferences

•Core team members made presentations about the grant to the Board of Trustees and at SW

Washington Experts conference at Skamania

•Explore options for introducing an experimental a FAST-TRACK alternative

•Continue to explore ways to collaborate with ESD112.

•Continue FIG participation, classroom observations and use of CATs in the classroom.

•Developing concept tests that will be made available to faculty in the fall.

•Worked with the Office of Planning and Effectiveness on various measures of success rates

Original Activities proposed in Phase I and progress made in Phase II:

1st: create a comprehensive understanding of what is being taught and how it should be taught.

Classroom observations and faculty collaboration in FIGs lead to significant progress on this

project goal. The Student Survey piloted this year allowed the team to gain insights into student attributes that will assist faculty in determining how pre-college math should be taught in a way that could lead to higher success rates.

2nd: determine a set of SLOs and associated assessments for each course within the precollege

math program.

In Phase I the core team identified a comprehensive set of Student Learning Outcomes that run through all levels of pre-college math. During Phase II the team developed a number of

CATs and implemented those in pre-college math courses across all three departments.

Concept tests developed in Phase II will be delivered in pre-college math courses taught by RPM instructors in year 3 of the grant.

3rd: develop Faculty Inquiry Groups (FIGs) to encourage instructional approaches designed

to increase student engagement and deepen mathematical understanding.

This goal was met in Phase II of the grant. Two FIGs continue to be active this summer.

Meetings are held where faculty can collaborate on ways to increase student engagement and share best practices as well as obstacles that students face. FIG activity will continue and expand to more teachers during Year 3 of the grant.

4th: identify a set of student attributes that will be part of the expectations teachers convey to

students throughout their participation in the program.

Significant progress has been made to identify a set of student attributes for student success.

A Student Attributes survey was delivered to a number of pre-college math students. A comprehensive report was developed and based on the report plans are being made this summer to revise some of the questions and prepare the survey for distribution to a much larger number of pre-college math courses in the 2011-2012 academic year.

5th: create assessments and identify deficiencies in how we assist students in achieving success.

Four workshops were held on the topic of classroom assessment techniques. Faculty worked collaboratively to develop CATs that were then shared within FIGs and implemented in precollege math courses across all three departments. The major focus of the classroom observations is to view how well students are engaged during class. The observations and the sharing that takes place among FIG members afterwards is helping to identify deficiencies and develop creative ways to help students become more successful.

**Common practices?**

The core project themes were the main focus of activities at Clark College this year. During fall quarter:

i. Presentations where held at the beginning and end of fall quarter to build awareness and recruit faculty to participate in Faculty Inquiry Groups (FIGS)

ii. The team presented 3 CAT Workshops at the main campus and the Town Plaza Center with a total of 41 instructors attending, iii. The core team formed a FIG and developed FIG meeting procedures, a protocol for classroom observations, tested several CATs and studied one complex lesson. These experiences in the fall provided an opportunity to learn about the dynamics of a meeting as a FIG, participating in a classroom observation, and developing and testing a CAT. These activities were critical preparation for Winter Quarter activities when several core members would lead their own FIG comprised of new teachers.

In the Winter quarter:

i. additional CAT workshops were held

ii. 4 FIGs were established, each meeting at least 2 times during the quarter

iii. FIG group members were encouraged to participate in classroom observations as well as developing and implementing CAT’s. This work continued in Spring quarter, with 6 FIGs and continues into the summer with 2 FIGs.

Below is an example of an activity report for one of the FIGs which had 7 members:

Winter quarter: 2 FIG meetings February 4th and 18th for 1.5 hours each; 13 classroom

observations; 37 CAT’s used by participants.

Spring quarter: 2 FIG meetings April 15th and May 6th for 1.5 hours each; 12 classroom

observations; 16 CAT’s used by participants.

Summary of lessons learned from classroom observation/exchanges:

• Varying pacing of instruction within a classroom and between classrooms

• Variation in formative assessments from CATs training (i.e., Muddiest Point, Memory

Matrix, & One-Minute Paper) to blind hand raising, to Concept Test Questions

• A wide range of teaching methods: mini-lectures, using the white board, using websites,

PowerPoint, discussing homework problems, presenting material in the lesson using example

problems, responding to questions, students participating in active learning- working in groups/moving around classroom measuring/students adding to data on board or in a chart

• Changing activities every 20 min to keep class moving and increase attention span

• Discovering similarities between material covered in ABE math courses, DVED math

courses, and Math 030

• Classroom management: how instructor handled rude or disruptive students

• Instructors planning more interactive lessons for the visiting teacher

• Application of a variety of teaching skills and methods

Summary of lessons learned concerning the use of CATs.

• Use of CAT every day to get instant feedback (close eyes, raise hand if got correct)

• Concept Test Questions used to see if students are understanding material, sometimes take

more time to discuss than originally planned

• Making adjustments to teaching method and content based on feedback from the CAT

• Illustrating the need to identify different way to teach certain concepts

• Determining the optimal length of time needed to complete a CAT based on discussion with students and analysis of data from Factor Matrix CAT. Data used: how many problems students got correct, time spent, calculated mean and median.

One of the most exciting achievements of the FIG activity this year was to see interdepartmental classroom observations/exchanges taking place across the three instructional units: ABE, DVED, and Math. This builds a greater understanding of all the levels of pre-college math that a Clark College student may encounter and will helps faculty identify common core concepts being taught as well as determine those concepts that students struggle with at all levels. Greater understanding of the various levels has led to some very exciting dialogue and collaboration among faculty members.

**Evidence on faculty perspectives and practice?**

The combination of classroom exchanges and FIG meeting participation has empowered faculty to implement new ideas. This has provided more opportunities for open dialogue and collaboration among faculty members in all three departments. Specifically the classroom exchanges have been a very meaningful experience for the faculty, allowing them to sit and

observe how the students are absorbing information presented in the class. Additionally the

FIG meetings give faculty a chance to share in collegial environment, their challenges, and

successes. After implementing a specific CAT the FIG groups have been able to share their

results and discuss additional best practices to bring about greater student engagement and

success.

It is not possible to gather quantitative data on changes in perspective and behavior. We can

report the number of faculty who are attending FIG meetings, the number of classroom observations that have taken place, and the number of CAT’s that have been implemented in various courses. Moreover, the observations within the departments can be presented as qualitative data: increased dialogue between faculty members, and increased faculty collaboration to develop more effective teaching methods.

The above mentioned openness to sharing ideas, collaboration, and willingness to have a colleague observing their class, is exactly what we hoped to see happening in this project. We are confident that a greater understanding of how and why the students struggle in pre-college math, and a willingness to adjust the way concepts are being taught, will result in increased student success. Therefore, we strongly believe that FIG process should be continued and sustained in the future.

The Math Department will begin a new initiative in 2011-2012 to provide a collaborative opportunity to all faculty with the RPM project. It will focus on the need to make instruction more consistent in the pre-college math courses. The full-time instructors will meet with precollege math instructors at the beginning of the year to discuss protocols in teaching and assessing students learning. Impetus for this new initiative came, in part, from FIG activities that put special attention on student success in pre-college math. The concerns about consistency was often mentioned by adjuncts at the FIG meetings and these concerns were forwarded to leadership in the Math Department which led to this growing interest in finding ways to make students more successful in pre-college math. Already, a number of RPM team members have volunteered to assist in this process. This new initiative will create opportunities to collaborate with the Math Department as a whole.

North Seattle

**General Changes?**

Our goal is to increase the number of students who successfully complete their precollege

math, raise the number of students transitioning into college-level math and add more students

into science, math or engineering fields. Serendipitously, these are also the goals of several

other focused college initiatives. To accomplish this, our project addressed three major

educational practices:

1. What is taught: We successfully offered a yearlong series of hardlink classes. In Fall 2010,

Beginning Algebra I (MATH 084) was hardlinked with a math study skills class taught by

one of our counselors. In the winter quarter, Beginning Algebra II (MATH 085) was

hardlinked with a supplemental math instruction. In spring, we taught Intermediate Algebra

(MATH 098) with Environmental Science (ENV 150). The supplemental instruction had

students working in groups, tackling more in-depth math activities from skill-oriented ones to

contextually-based to those that require in-depth explanation and writing. Students were

required to keep a journal of their math experiences. From the in-class assessment, students

seem to enjoy and benefit from this link. In the math/env link, both instructors made sure that

each math topic had some environmental application, each test had some integrative question,

group project had both disciplines in them, etc. The class is extremely problem-solving

oriented with heavy applications in environmental math. The attendance was good and the

drop rate quite low. From the common core final analysis, it seems that there is some deeper

math understanding occurring in the linked class. Because of the positive feedback, we are

adding more linked classes this coming academic year. In fall quarter, we are linking Basic

Math with Study Skills, MATH 084 with supplemental instruction and MATH 098 with ENV

150. We will also be analyzing the effectiveness of these approaches by examining data on

student retention and success relative to traditional offerings of the same courses.

2. How we teach: More than half the math faculty have shifted away from the “traditional”

lecture mode of teaching. Group work is extensively incorporated and students are strongly

encouraged to form study groups. With the help of courses from Harvard and the Cedarbrook

sessions, faculty have been quite creative at developing innovative group work activities.

Some that were shared during our "Reflection Friday" were very delightful and easily doable

with little planning on faculty’s part. The activities hone algebra skills in a fun and engaging

way. We have added more contextually-based activities into our courses in order to deepen

students’ math understanding. We have made great effort to show where algebra can be

applied to the point where it has changed some students’ attitude towards math.

3. How we assess: Innovative classroom assessments are becoming part of daily routine. A

number of faculty have come up with creative ways to assess student learning. Using their

assessment results, faculty have adjusted their teaching styles, brainstormed how to get better

student understanding rather than jamming down more material at breakneck speed. There is

a more deliberate awareness of student needs. Many experiences and assessment methods

have been shared through our biweekly “Reflection Friday” events and have invigorated a

number of faculty to try and incorporate more assessment into their teaching. The

implementation of the common core finals on each of our precollege classes will also have an

impact on how the math faculty, as a department, assess student learning. Having wide

conversation of what is to be on the core final is of great value.

The 2-quarter data collected by our IR indicates some improvement in overall completion

rate. The small steps have taken such as linking more precollege classes, doing more

assessment and group activities, getting together biweekly, etc. are slowly manifesting that we

are headed in the right direction.

**Common practices?**

1. Classroom exchanges are being done every quarter but not at the rate we had hoped for.

Faculty who have been able to participate in faculty exchanges have found the practice

extremely valuable. They are being exposed to alternative ways to approach lessons and

concepts for their class, and are reporting in the "Reflection Fridays," that they have made

adjustments to their own approaches because of the exchanges. The beauty of the exchange

process is that faculty discuss before, during and after the observation, and can really delve

into the depths of why they teach they way they do. Unfortunately, classroom exchanges are taking place at a lesser rate than originally planned. The majority of exchanges that happened this past year were completed in the Fall Quarter. In an effort to facilitate the exchanges and increase the number occurring, a faculty load grid was created by Barbara Goldner showing when faculty are in and out of the classroom. Unfortunately, most faculty teaching times overlap which prevents some exchanges from occurring. Strategies for getting more exchanges completed next year are being explored.

2. The majority of math faculty involved in the grant have incorporated classroom assessments

as part of their effort to help students find success in math, deepen students’ math

understanding and complete their precollege math in a timely fashion. The retreat at

Cedarbrook and ongoing conversations with colleagues during our “Reflection Friday” have

raised our understanding of what classroom assessment is, why it is important and how to do

classroom assessment without taking up a lot of class time. Ben Aschenbrenner is in charge

and is a very passionate advocate of classroom assessment. The college has also put

assessment at the forefront of all instruction which integrates nicely with the work of the grant

activities. There are ongoing workshops, small group discussion, etc. on assessment through

our Teaching and Learning Center. Interestingly, the grant project has become a model for

how faculty can explore and implement promising practices into their classroom around

assessment activities. Math faculty in the grant are being asked to share what they are

learning with non-Math faculty broadening the reach of the grant activities.

3. Our “Reflection Friday” was meant to be faculty inquiry time but has evolved into a combination of exchange of ideas, problem solving, math discussion etc. It is very well attended, has boosted camaraderie and has become one of the highlights of the grant. It is headed by Michael Gaul. Unfortunately, as successful as it is, “Reflection Friday” is not faculty inquiry. At the beginning of spring, we realized we needed to form small faculty inquiry groups, which we have called “figlets.” Three inquiry groups were identified. One was going to tackle issues on student skill in basic math, another was going to focus on group work in the classroom and the third was going to tackle throughlines in precollege math. Faculty have already expressed interest as to which figlet they want to belong. Unfortunately, because of all the various commitments and time constraints that spring quarter brings, figlets never took off. The plan is to roll these groups out in the Fall, and again to incorporate their work into the broader context of the college assessment and strategic plans as well as focus in on the specific issues of pre-college math.

**Evidence on faculty perspectives and practice?**

At the recent spring math conference, a group of faculty did a panel discussion to inform others of the changes occurring at North due to the grant. Four primary topics were addressed: classroom exchanges, classroom assessment, Reflection Friday and our learning resource bank. A videotape of one of our "Reflection Friday" events was also made. The discussion was very lively and the panel was pretty successful at getting some schools into thinking about ways to enhance their precollege math and encourage more faculty collaboration.

Our biweekly Reflection Friday attendance and the sheer number of faculty who go to Cedarbrook and Sleeping Lady retreats attest to the eagerness of North's faculty to learn new and innovative classroom techniques for more student success. This grant has made the math department very cohesive. It has energized the math faculty as never seen before. Reflection

Friday has become a model for how faculty can explore promising practices and new pedagogies into their classroom.